

## THE GENUS *CHLAMYDOSPORIUM* PEYRONEL

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**ABSTRACT** - The type and only species of *Chlamydosporium* Peyronel, *C. submersum* Peyronel is shown to be the chlamydosporic state of *Phoma eupyrena* Sacc. The relationships of *Chlamydosporium* to *Scytalidium* Pesante and *Peyronellaea* Goidanich ex Goidanich are discussed and the nomenclatural implications described.

**RÉSUMÉ** - L'espèce-type du genre monospécifique *Chlamydosporium*, *C. submersum* Peyronel, s'est révélée correspondre à la forme chlamydosporée de *Phoma eupyrena* Sacc. Les liens entre les genres *Chlamydosporium*, *Scytalidium* Pesante et *Peyronellaea* Goidanich ex Goidanich sont analysés et les implications nomenclaturales qui en découlent précisées.

**KEY WORDS** : *Chlamydosporium*, *Scytalidium*, *Phoma eupyrena*, taxonomy.

### INTRODUCTION

For his degree in natural science, Peyronel (1913) presented a treatise in which he described in general terms the main results of several cultural experiments he made on "The atmospheric germs of fungi with Mycelia". The laboratory work was conducted at the Istituto Botanico (Padua) under the guidance of Prof. P.A. Saccardo whose experience of microscopic fungi benefited Peyronel. The thesis was accompanied by 90 plates of hand-coloured illustrations depicting elements of all species encountered. The printed part comprised two sections, the second of which reported the diagnoses of two new genera and thirty new species. Amongst these was *Chlamydosporium* nov. gen. with a single species, *C. submersum* sp. nov., isolated from the atmosphere in a *Larix* wood in Riclaretto (Pinerolo), It. bor.

*Chlamydosporium* was introduced with the following generic diagnosis: '(Etym. a *chlamydospora*) *Hyphis radiatim repentibus et in gelatina submersis, ramosis, septatis, hyalinis, chlamydosporas fuscas irregulariter intercalares gerentibus. Conidiophora genuina desunt. Genus paradoxum, sed cui adscribam nescio.*' The sole species and therefore the holotype, *C. submersum*, was described as follows: '*Hyphis radiantibus, repentibus, in agaris omnino submersis maculamque fuliginis efformantibus, hyalinis, septatis, 7-10µm crassis, inter-*

*dum gemmis lateralibus chlamydosporisque intercalariibus, fuliginis, 5,5-10 x 7-10µm praeditis, ramosis; ramis tenuioribus, 2,5-4µm crassis, hyalinis, septatis, chlamydosporis fuliginis, crassioribus, solitariis, binis vel ternis, oblongis vel subglobois, 6-10 x 3-6 crebre interruptis.*

The genus was not placed in any suprageneric rank and there is little additional information on it or the single species since they were introduced. Trotter in Saccardo (1931) repeated the diagnoses and assigned the genus to the Deuteromycetae, Dematiaceae. Clements & Shear (1931) regarded the genus as dubious but noted that they had not seen the original publication. Carmichael et al. (1980), in a compilation of hyphomycete generic names, repeated the brief comment by Clements & Shear (1931). In a list of hyphomycete genera recorded from soil but excluded from the group of acceptable genera Barron (1968) assigned *Chlamydosporium* to the Mycelia Sterilia. There have been no subsequent descriptive accounts of the taxa.

## MATERIALS AND METHODS

An isolate of *C. submersum* was retrieved from the oil collection in the IMI Culture Collection. It was first accessed in June/July 1956 and received from B. Peyronel. It was originally isolated by Anna Mosca from soil of a *Larix decidua* planting in Italy in 1954. Records in IMI state that the isolate was identified by Peyronel so the dried material filed in Herb. IMI is authentic for the name *C. submersum* Peyronel. No material of the species is preserved in Herb. PAD (Gola, 1930) and it is therefore presumed that there is no extant holotype. Although the dried IMI material and the culture in the IMI Culture Collection have no formal nomenclatural standing, since this culture was identified by the original author of the species as belonging to that species it is here proposed to designate the dried sample IMI 62531 as neotype for the name *Chlamydosporium submersum* Peyronel.

After retrieval the isolate was grown on MA, PCA and PDA for 6 weeks at 25°C under alternating periods of 12h dark:12h near UV. Descriptions of culture appearance are based on these treatments. Colour terminology and standards are according to Rayner (1970).

## RESULTS

### Colony appearance

On PDA aerial mycelium abundant, compact and dense to the margin but not fluffy or tufted, with contrasting grey olivaceous strands of hyphae, finally colonies mouse grey to pale mouse grey with a central greyish sepia area. There is some indistinct zonation, particularly with respect to conidiomatal formation which is more abundant towards the margin where conidiomata are semi-immersed.

On MA aerial mycelium abundant, compact and dense, isabelline but slightly paler in the centre, thinning out towards the periphery where it finally becomes immersed to give colonies a wide sepia margin. There is al-

most no sign of zonation. Conidiomata are scattered in the aerial mycelium except at the margin where they are superficial on the agar.

On PCA aerial mycelium sparse, thin, appressed to the surface of the agar, relatively more abundant at the centre but very thin towards the margin, distinctly zonate and associated with regions of conidiomatal formation, lavender grey in the centre, immersed mycelium fuscous black becoming greyish sepia at the margin.

### Morphology

Conidiomata, conidia and chlamydo-spores formed on all media. **Conidiomata** pycnidial, single not aggregated, spherical to ampulliform, thin-walled, pale brown, composed of textura angularis. 60-250 $\mu$ m diam. with a central, circular, sometimes slightly papillate ostiole up to 30 $\mu$ m diam. **Conidiophores** absent. **Conidiogenous cells** ampulliform to doliiform, hyaline, 4.7 x 4.5 $\mu$ m, formed from the inner cells of the conidiomatal wall. **Conidia** hyaline, ellipsoid to cylindrical, straight, frequently biguttulate, 3.5 x 2-2.5 $\mu$ m (PDA and PCA), 3.5-6 x 2-3 $\mu$ m (MA). **Chlamydo-spores** pale, medium to dark brown, smooth, terminal or intercalary, sometimes catenate, 9-12 x 4-7 $\mu$ m (intercalary), 7.5-11.5 x 4-7.5 $\mu$ m (terminal).

### DISCUSSION AND CONCLUSIONS

In all treatments and cultural conditions the isolates produced chlamydo-spores and fertile pycnidial conidiomata. The morphology and dimensions of the conidiomata, conidiogenous cells and conidia, and details of conidiogenesis clearly place the species in *Phoma* Sacc., according to the account given by Sutton (1980). The number of *Phoma* species producing chlamydo-spores in culture is few and this particular isolate keys out readily to *P. eupyrena* Sacc. It agrees with the accounts by Dorenbosch (1970), Boerema (1976) and Sutton (1980). Although the range in conidial size was marginally greater than reported by these authors, this taxonomic feature is very dependent on culture conditions (Sutton, 1964) and is not regarded as an impediment to the identification of this isolate as *P. eupyrena*. This species is reported by Sutton (1980) from 30 generic plant host substrata and from soil, sewage, sand and veterinary sources, and is known from several locations in Europe. Some IMI records from soil are from coniferous plantations in the UK. Dorenbosch (1970) regards it as one of the most common soil-inhabiting species of the genus. The inclusion of this Italian isolate therefore is in no way at variance with existing data on the species. Peyronel (1913) described lateral chlamydo-spores as 5.5-10 x 7-10 $\mu$ m and terminal and intercalary ones as 6-10 x 3-6 $\mu$ m. These approximate to the dimensions obtained from the culture under study. The chlamydo-spores of *P. eupyrena* are morphologically much simpler than those of some *Phoma* species which have been placed in *Peyronellaea* Goidanich ex Goidanich. This genus was based on *Phoma*-like pycnidial fungi which produce multicellular chlamydo-spores with a superficial resemblance to the dictyospores found in the dematiaceous hyphomycete genera *Alternaria* Nees, *Stemphylium* Wallroth and *Co-*

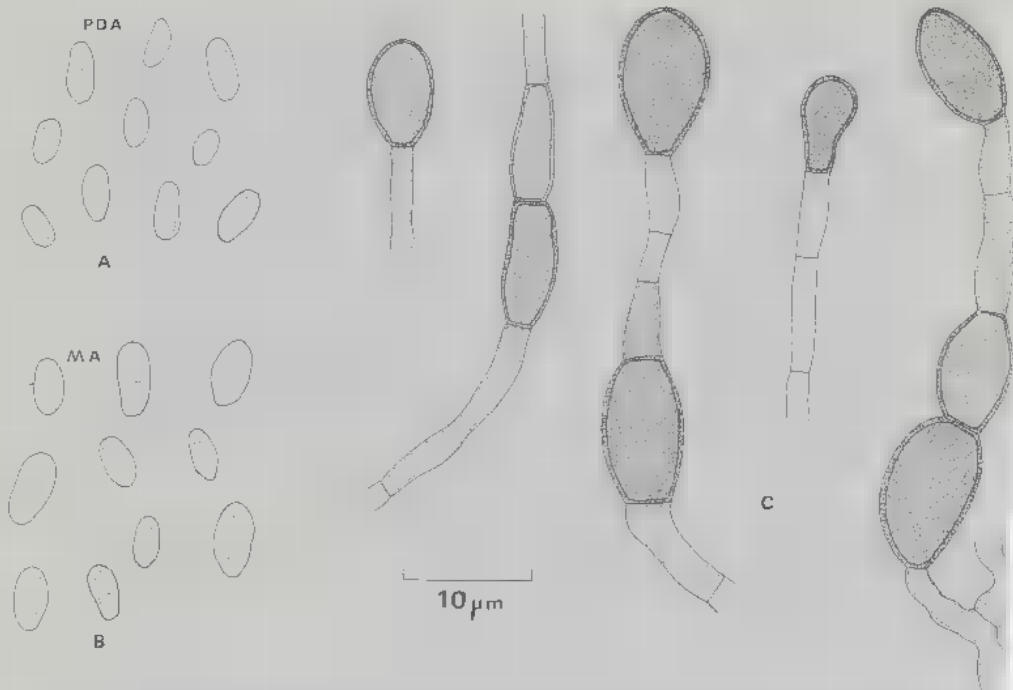


Fig. 1. *Phoma eupyrena* (*Chlamydosporium submersum*) (IMI 62531). A, conidia from pycnidia on PDA; B, conidia from pycnidia on MA; C, mycelial chlamydo-spores on MA.

*niothecium* Corda. Boerema et al. (1965) reduced *Peyronellaea* to synonymy with *Phoma*.

The binomial *Chlamydosporium submersum* provides a name for the chlamydo-spore state of *Phoma eupyrena* but the implications of this conclusion are rather wider-reaching. Sigler & Carmichael (1976) accepted the name *Scytalidium* Pesante (1957) for several taxa without pycnidial states and also for the chlamydo-spore state of *Hendersonula toruloidea* Nattrass. In a revision of *Hendersonula* Sutton & Dyko (1989) adopted this conclusion although they found it necessary to make nomenclatural changes resulting from type studies. *H. toruloidea* became *Nattrassia mangiferae* (H. Sydow & Sydow) Sutton & Dyko and *Scytalidium dimidiatum* (Penz.) Sutton & Dyko was taken up for the chlamydo-spore state. The problem clearly is that *Chlamydosporium* Peyronel (1913) antedates *Scytalidium* (1957) and should correctly be taken up for the several species now formally ascribed to this genus. Type studies in *Scytalidium* are beyond the scope of the present work and formal placement of these taxa in *Chlamydosporium* must await a further revision of *Scytalidium* species. An alternative, which would provide the stability in nomenclature that should be strived for, is to propose conservation of *Scytalidium* over *Chlamydosporium*.

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